

REMARKS

Claims 79-82 and 85-92 are pending in this application. Claims 79-81 and 85-92 have been amended. No new matter has been introduced.

Claims 79-82, 85-87, 89 and 92 stand rejected under 35 U.S.C. § 102(e) as anticipated by, or, in the alternative under 35 U.S.C. §103(a) as obvious over Xing et al, U.S. Patent No. 6,090,697 (“Xing”). This rejection is respectfully traversed.

The claimed invention relates to integrated circuits having a platinum group metal thin film layer, used, for example, as the lower electrode in a capacitor. Specifically, amended independent claim 79 recites a “capacitor comprising: a substrate having a trench; a barrier layer disposed over a surface of said trench; a first electrode in contact with said barrier layer at a sidewall region; a dielectric layer in contact with said first electrode and said barrier layer; and a second electrode in contact with said dielectric layer at a sidewall region.” Amended independent claim 79 also recites that “at least one of said first and second electrodes comprises a *uniform*, essentially carbon-free oxygen annealed photo-decomposed platinum group metal film.”

Xing relates to a high-selectivity via etching process. (Abstract). Specifically, Xing teaches a process in which an etchstop layer is formed; a dielectric layer is formed over the etchstop layer, and etching the dielectric layer with a fluorine-bearing etchant.

In considering FIG. 2 and other figures, Xing fails to teach or suggest a capacitor having at least one electrode “at a sidewall region” being “a *uniform*, essentially carbon-free oxygen annealed photo-decomposed platinum group metal film.” Indeed, Xing discloses a step of forming a platinum layer by conventional sputter deposition. (Col. 10, lines 30-34). Because Xing uses the process of forming a platinum layer by conventional sputter deposition, the platinum layer disclosed by Xing will not be “uniform” nor will it be “essentially carbon-free” at a sidewall region. For at least these reasons, Xing fails to disclose all limitations of amended independent claim 79, and withdrawal of the rejection of claims 79-82, 84-87, 89, and 92 is respectfully requested.

Claims 88, 90 and 91 stand rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Xing and further in view of Summerfelt et al., U.S. Patent No. 5,566,045 (“Summerfelt”). This rejection is respectfully traversed.

Summerfelt relates to a thin unreactive film (platinum) contacting a high-dielectric-constant material to an electrode. (Abstract). Summerfelt, like Xing, uses conventional sputter deposition methods to form the platinum layer. (Col. 8, lines 26-29). Summerfelt, therefore, fails to teach or suggest a capacitor having at least one electrode “at a sidewall region” being “a uniform, essentially carbon-free oxygen annealed photo-decomposed platinum group metal film.” Therefore, neither Xing nor Summerfelt, either considered alone, or in combination, teach or suggest all claim limitations of amended independent claim 79, and Applicant respectfully requests that rejection of claim 88, 90, and 91 be withdrawn.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned “**Version with markings to show changes made.**”

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In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

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Respectfully submitted,

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Version With Markings to Show Changes Made

79. (Third Amended) A capacitor comprising:

a substrate having a trench;

a barrier layer disposed over a surface of said trench;

a first electrode in contact with said barrier layer at a sidewall region;

a dielectric layer in contact with said first electrode and said barrier layer; and

a second electrode in contact with said dielectric layer at a sidewall region,

wherein at least one of said first and second electrodes comprises a uniform, essentially carbon-free [an] oxygen annealed photo-decomposed platinum group metal film.

80. (Third Amended) The capacitor according to claim 79, wherein said uniform, essentially carbon-free oxygen annealed photo-decomposed platinum group metal film comprises PT.

81. (Third Amended) The capacitor according to claim 79, wherein said first electrode comprises said uniform, essentially carbon-free oxygen-annealed photo-decomposed platinum group metal film.

85. (Twice Amended) The capacitor of claim 79, wherein said uniform, essentially carbon-free oxygen annealed photo-decomposed platinum group metal film is oxidation resistant.

86. (Twice Amended) The capacitor according to claim 79, wherein said uniform, essentially carbon-free oxygen annealed photo-decomposed platinum group metal film comprises Rh.

87. (Twice Amended) The capacitor according to claim 79, wherein said

uniform, essentially carbon-free oxygen annealed photo-decomposed platinum group metal film comprises Pd.

88. (Twice Amended) The capacitor according to claim 79, wherein said uniform, essentially carbon-free oxygen annealed photo-decomposed platinum group metal film comprises Os.

89. (Twice Amended) The capacitor according to claim 79, wherein said uniform, essentially carbon-free oxygen annealed photo-decomposed platinum group metal film comprises Ir.

90. (Twice Amended) The capacitor according to claim 79, wherein said uniform, essentially carbon-free oxygen annealed photo-decomposed platinum group metal film comprises Au.

91. (Twice Amended) The capacitor according to claim 79, wherein said uniform, essentially carbon-free oxygen annealed photo-decomposed platinum group metal film comprises Ag.

92. (Twice Amended) The capacitor according to claim 79, wherein said uniform, essentially carbon-free oxygen annealed photo-decomposed platinum group metal film comprises Ru.